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Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1.   (*currently amended*) A method for interfacing between one or more requestors and one or more airline availability information sources, comprising the steps of:

(1)   receiving a first request from a first requestor for airline availability information;

(2)   querying one or more airline availability information sources for the requested airline availability information;

(3)   receiving the requested airline availability information from the one or more airline availability information sources;

(4)   caching the received airline availability information;

(5)   providing the received airline availability information to the requestor;

(6)   receiving a second query from a second requestor for the airline availability information; and

(7)   determining to provide the second requestor with at least one of the following types of airline availability information:

real-time information; and

cached information;

(8)   providing information to the ~~client~~ second requestor in accordance with the determination made in step (7).

2.   (*currently amended*) The method according to claim 1, further comprising the steps of:

(9)   monitoring airline availability information traffic between an airline availability information source and one or more clients of the airline availability information source; <u>and</u>

(10)   caching at least a portion of the monitored airline availability information[;]<u>.</u>

3.   (*currently amended*) The method according to claim 1, further comprising the steps of:

(9)   proactively generating one or more queries independent of requestor queries; <u>and</u>

(10)   sending the one or more proactively generated queries to an airline availability information source and caching information returned therefrom.

4.   (*currently amended*) The method according to claim 1, further comprising the steps of:

(9)   monitoring airline availability information traffic between an airline availability information source and one or more clients of the airline availability information source;

(10)   caching at least a portion of the monitored airline availability information;

(11)   proactively generating one or more queries independent of requestor queries; <u>and</u>

(12)   sending the one or more proactively generated queries to an airline availability information source and caching information returned therefrom.

5.   (*original*) The method according to claim 3, further comprising the steps of:

(11)   adding the requestor queries to a query priority queue;

(12)   adding proactively generated queries to the query priority queue, at lower priorities than the requestor queries; and

(13)   processing the requestor queries and the proactively generated queries according to their priorities.

6.   (*currently amended*) The method according to claim 5, wherein step (11) comprises the steps of:

(a)   separating a first requestor query into one or more sub-queries;

(b)   prioritizing the one or more first requestor sub-queries with respect to one another;

(c)   placing the one or more first requestor sub-queries in the query priority queue;

(d)   separating a second requestor query into one or more sub-queries;

(e)   prioritizing the one or more second requestor sub-queries with respect to one another; <u>and</u>

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(f)   placing the one or more second client sub-queries in the query priority queue, ordering the first requestor sub-queries with respect to the second requestor sub-queries according to associated times of receipt, resolving priority disputes between simultaneously received first and second requestor queries so that higher priority sub-queries of the first and second requestors are processed before lower priority sub-queries of the first and second requestors.

7.   (*currently amended*) The method according to claim 3, wherein step (9) comprises the ~~steps~~ step of proactively generating queries to populate cache.

8.   (*currently amended*) The method according to claim 3, wherein step (9) comprises the ~~steps~~ step of proactively generating queries to update cached information.

9.   (*original*) The method according to claim 3, wherein step (9) comprises the step of ordering the proactive queries for processing based on time-to-departures and age of associated cached information.

10.   (*original*) The method according to claim 9, wherein step (9) further comprises the steps of:

(a)   generating a plurality of storage buckets in a memory;

(b)   associating at least a portion of the buckets with various time-to-departures;

(c)   ordering the buckets according at least to their associated time-of-departures;

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(d)   bucketing the proactive queries according at least to their associated time-to-departures;

(e)   ordering the proactive queries within the buckets at least according to ages of previously cached data associated with the proactive queries;

(f)   re-bucketing the proactive queries as their associated time-to-departures change; and

(g)   selecting a bucket for processing according to the ordering of step (9)(c), processing the proactive queries within the selected bucket, skipping proactive queries for which information is presently cached and newer than a predetermined age.

11.   (*original*) The method according to claim 10, wherein:

step (9)(b) comprises the step of associating the buckets with various time-to-departures and according to one or more modes of transportation, and

step (9)(c) comprises the step of ordering the buckets according to the nearness to time-of-departures and the associated modes of transportation.

12.   (*original*) The method according to claim 10, further comprising the steps of:

(11)   adding the requestor queries to a query priority queue;

(12)   adding proactively generated queries from buckets selected in accordance with step (9)(g), to the query priority queue, at lower priorities than the requestor queries; and

(13)   processing the requestor queries and the proactively generated queries in the query priority queue according to their priorities.

13.   (*currently amended*) The method according to claim 12, wherein step (11) comprises the steps of:

(a)   separating a first requestor query into one or more sub-queries;

(b)   prioritizing the one or more first requestor sub-queries with respect to one another;

(c)   placing the one or more first requestor sub-queries in a query priority queue;

(d)   separating a second requestor query into one or more sub-queries;

(e)   prioritizing the one or more second requestor sub-queries with respect to one another; and

(f)   placing the one or more second client sub-queries in the query priority queue, ordering the first requestor sub-queries with respect to the second requestor sub-queries according to associated times of receipt, resolving priority disputes between simultaneously received first and second requestor queries so that higher priority sub-queries of the first and second requestor are processed before lower priority sub-queries of the first and second requestor.

14.   (*original*) The method according to claim 1, wherein:

step (6) comprises the step of receiving a second requestor preference for real-time information and/or cached information; and

step (7) comprises the step of determining to provide the second requestor with real-time information and/or cached information based at least in part on the second requestor preference.

15.   (*currently amended*) The method according to claim 1, wherein step (8) comprises the step of determining to provide the second requestor with real-time information and/or cached information based at least in part on one or more of the following factors:

an availability of requested information in cache;

a currently cached flight availability count;

a client preference for cached and/or realtime data;

an age of the cached information;

a client identification and/or client importance factor;

a time of day;

a proxy availability;

availability of recently cached information;

one or more rules associated with an information source[.];

an activity/load at a realtime information source;

anticipated turn around time to an information source;

total number of seats;

a nearness to time-to-departure;

a market importance;

a frequency of prior availability changes; and

a mode of transportation.

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16.   (*currently amended*) The method according to claim 1, further comprising the ~~steps~~ step of:

(9)   querying one or more information sources through one or more proxies.

17.   (*currently amended*) The method according to claim 16, wherein step (9) comprises the ~~steps~~ step of:

(a)   monitoring an operational status of the one or more proxies and selecting proxies for querying based on the monitored operational status.

18.   (*currently amended*) The method according to claim 16, wherein step (9) comprises the ~~steps~~ step of:

(a)   monitoring response times for the one or more proxies and selecting proxies for querying based at least on the response times.

19.   (*currently amended*) The method according to claim 16, wherein step (9) comprises the ~~steps~~ step of:

(a)   maintaining a list of unsupported suppliers for which information is not available on the one or more information sources; and

(b)   returning queries for information from the unsupported suppliers without querying an information source.

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20. (*original*) The method according to claim 16, wherein step (9) comprises the steps of:

(a) maintaining proxy records for available proxies in a proxy queue;

(b) removing a higher priority proxy record from the proxy queue to process a query.

21. (*original*) The method according to claim 20, wherein step (9)(a) comprises the steps of maintaining the proxy queue as part of a query priority queue.

22. (*currently amended*) The method according to claim 1, wherein step (1) further comprises the step of receiving a first request from a first requestor for one or more of the following additional types of information:

hotel availability information;

rental car availability information;

taxi availability information;

entertainment availability information; and

restaurant availability information;

wherein steps (2) through (8) are performed with the one or more types of additional ~~type~~ types of information.

23. (*original*) The method according to claim 14, wherein step (6) further comprises the step of permitting the second requestor to select one of the following options:

return real-time data only;

return cached data only;

return cached data if available, otherwise consult real-time data source; and

return cached data if the cached data is less than N seconds old, otherwise consult real-time data source.

24.   (*original*) The method according to claim 14, wherein step (6) further comprises the step of permitting the second requestor to select and prioritize a plurality of the following options:

return real-time data only;

return cached data only;

return cached data if available, otherwise consult real-time data source; and

return cached data if the cached data is less than N seconds old, otherwise consult real-time data source.

25.   (*original*) The method according to claim 1, further comprising the step of:

(9)   caching recently updated information separately from less recently updated information and searching the recently updated cached information when real-time data is sought.

26.   (*original*) The method according to claim 1, further comprising the steps of:

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(9)   permitting the requestors to specify approximate departure times in the requests for airline availability information; and

(10)   searching a cache for requested information.

27.   (*currently amended*) The method according to claim 26, wherein step (4) comprises the steps of:

(a)   rounding-up actual departure times for each flight, providing at least the rounded-up actual departure times to a hashing function, and storing information associated with the flights in a hash table based on resulting rounded-up hash table indexes; and

(b)   rounding-down actual departure times for each flight, providing at least the rounded-down actual departure times to the hashing function, and storing information associated with the flights in the hash table based on resulting rounded-down hash table indexes;

wherein step (10) comprises the steps of:

(a)   rounding-up a user specified departure time, providing the rounded-up user specified departure time to the hash function, and searching the hash table based on a resulting hash table index; and

(b)   rounding-down a user specified departure time, providing the rounded-down user specified departure time to the hash function, and searching the hash table based on a resulting hash table index.

28.   (*original*) The method according to claim 1, further comprising the steps of:

(9)   initiating a control thread for a request, whereby the request includes one or more sub-queries;

(10)   initiating a worker thread for each sub-query associated with the request;

(11)   prioritizing the worker threads with respect to one another; and

(12)   processing the worker threads according to associated priorities.

29.   (*original*) The method according to claim 1, wherein step (4) comprises the steps of sharing a flight availability count record between a plurality of flight records stored in the cache.

30.   (*currently amended*) The method according to claim 1, wherein step (4) comprises the steps of:

(a)   associating multiple flight records as married flight records in the cache; and

(b)   sharing a flight availability count record between at least one of the multiple flight records and another flight record in the cache.

31.   (*currently amended*) The method according to claim 1, wherein step (8) comprises the ~~steps~~ step of searching for cached information after waiting a pre-determined time for real-time information.

32. (*original*) The method according to claim 1, further comprising the step of:

(9) communicating with the one or more information sources through proxies, whereby the proxies interface with one or more of the information sources using information source specific codes.

33. (*original*) The method according to claim 32, wherein step (9) further comprises the steps of:

(a) measuring one or more response characteristics associated with the proxies;

(b) prioritizing the proxies according to the performance measurements; and

(c) maintaining a proxy priority queue, whereby queries are passed to higher priority proxies.

34. (*original*) The method according to claim 32, wherein step (9) further comprises the steps of:

(a) identifying one or more information sources that proxies cannot communicate with; and

(b) filtering out queries directed to the identified information sources.

35. (*original*) The method according to claim 32, wherein step (9) further comprises the steps of:

(a)   monitoring an operational status of the proxies; and

(b)   optimizing use of the proxies based on the operational status of the proxies.

36.   (*original*) The method according to claim 32, further comprising the step of:

(10)   simulating replies from the proxies.

37.   (*original*) The method according to claim 3, wherein step (10) comprises the step of sending the one or more proactively generated queries periods of low information source activity.

38.   (*original*) The method according to claim 3, wherein step (9) comprises the step of generating background threads that pose queries that appear to come from requestors.

39.   (*original*) The method according to claim 3, wherein step (9) comprises the step of filtering one or more queries out of proactive caching.

40.   (*original*) The method according to claim 39, wherein step (9) further comprises the step of filtering out queries related to airline flights for which fares are not available.

41.   (*original*) The method according to claim 39, wherein step (9) further comprises the step of filtering out queries related to flights on unsupported carriers.

42.   (*original*) The method according to claim 39, wherein step (9) further comprises the step of filtering out queries related to flights that users are not expected to request.

43.   (*original*) The method according to claim 3, wherein step (9) comprises the step of assigning priority to queries according to an associated market.

44.   (*original*) The method according to claim 3, wherein step (9) comprises the step of assigning priorities to queries according to a frequency of flights.

45.   (*original*) The method according to claim 3, wherein step (9) comprises the step of assigning priorities to queries according to a frequency of changes associated with availability of corresponding flights.

46.   (*original*) The method according to claim 3, wherein step (9) comprises the step of assigning priority to queries according to a market importance.

47.   (*original*) The method according to claim 3, wherein step (9) comprises the step of assigning priority to queries according to nearness of departure time.

48. (*original*) The method according to claim 3, wherein step (9) comprises the step of assigning priority to queries according to an age of cached data.

49. (*original*) The method according to claim 3, wherein step (9) comprises the step of assigning priority to queries according to a number of remaining available seats.

50. (*original*) The method according to claim 3, wherein step (9) comprises the step of assigning priority to queries according to anticipated increases in travel volume.

51. (*original*) The method according to claim 3, wherein step (9) comprises the step of assigning priority to queries according to a type of product/service.

52. (*original*) The method according to claim 3, wherein step (9) further comprises the step of assigning lower priority to forms of ground transportation.

53. (*original*) The method according to claim 3, wherein step (9) further comprises the step of assigning lower priority to flights that use propeller planes.

54. (*original*) The method according to claim 42, wherein step (2) further comprises the step of assigning priority according to a total number of available seats.

55.   (*original*) The method according to claim 3, wherein step (9) comprises the step of updating cached airline availability information according to multiple priorities.

56.   (*original*) The method according to claim 55, wherein step (9) further comprises the step of encoding the multiple priorities into a mathematical function that assigns a combined priority value to units of airline availability information, and updating the airline availability information according to the associated combined priority values.

57.   (*original*) The method according to claim 55, wherein step (9) further comprises the steps of:

(a)   prioritizing airline availability information according to departure times;

(b)   prioritizing airline availability information according to one or more additional features; and

(c)   updating the airline availability information based on a combination of the priorities associated with the departure time and one or more additional features.

58.   (*original*) The method according to claim 1, further comprising the step of:

(9)   predicting an availability status.

59.   (*original*) The method according to claim 58, wherein step (9) comprises the step of predicting availability status based on prior observed variables, including prior availability information.

60.   (*currently amended*) The method according to claim 59, wherein step (9) further comprises the steps of:

(a)   identifying one or more factors associated with availability status;

(b)   learning a relationship between historical values for the one or more factors and historical values for availability status;

(c)   generating a function according to the learned relationship; and

[(c)]   (d)   providing new values for the one or more factors to the function, whereby the function outputs predicted values for availability status.

61.   (*original*) The method according to claim 1, further comprising the steps of:

(9)   separating a first requestor query into one or more sub-queries;

(10)   prioritizing the one or more first requestor sub-queries with respect to one another;

(11)   placing the one or more first requestor sub-queries in a query priority queue;

(12)   separating a second requestor query into one or more sub-queries;

(13)   prioritizing the one or more second requestor sub-queries with respect to one another;

(14)   placing the one or more second client sub-queries in the query priority queue, ordering the first requestor sub-queries with respect to the second requestor sub-queries according to associated times of receipt, resolving priority disputes between simultaneously received first and second requestor queries so that higher priority sub-queries of the first and second requestors are processed before lower priority sub-queries of the first and second requestors; and

(15)   processing the queries in the query priority queue according to their associated priorities.

62.   (*currently amended*) The method according to claim 1, further comprising the ~~step~~ <u>steps</u> of:

(9)   monitoring airline availability information traffic between an airline availability information source and one or more clients of the airline availability information source;

(10)   determining a likelihood that information will be received in a near future by said monitoring;

(11)   generating proactive queries for information not likely to be received in the near future; and

(12)   caching information returned in response to the proactive queries.

63.   (*currently amended*) A method for interfacing between one or more requestors and one or more information sources, comprising the steps of:

(1)   receiving a first request from a first requestor for information;

(2)   querying one or more information sources for the requested information;

(3)   receiving the requested information from the one or more information sources;

(4)   caching the received information;

(5)   providing the received information to the requestor;

(6)   receiving a second query from a second requestor for the information; ~~and~~

(7)   determining to provide the second requestor with at least one of the following types of information:

real-time information; and

cached information; <u>and</u>

(8)   providing information to the ~~client~~ <u>second requestor</u> in accordance with the determination made in step (7).

64.   (*currently amended*) A computer program product including a computer useable medium having computer program logic stored therein to enable a computer to interface between one or more requestors and one or more information sources, wherein said computer program logic comprises:

a receiving function that causes the computer system to receive requests for information from information requestors;

a query process function that causes the computer system to determine whether to process a query out-of-cache or with real-time information, and that causes

the computer system to query one or more information sources when it determines to process a query with real-time information; <u>and</u>

a cache control function that causes the computer system to cache information returned from the one or more information sources.